

Notes on the Opisthobranch Fauna of South San Francisco Bay

BY

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(2 Text figures)

THE REPORTED OCCURRENCES of opisthobranch mollusks in San Francisco Bay have previously been restricted to the northern and central portions of the estuary (APLIN, 1967; GOSLINER & WILLIAMS, 1970; BEHRENS, 1971a, 1971b; HOLLEMAN, 1972; GODDARD, 1973). This report deals with the opisthobranch fauna of the southern reaches of the bay (Figure 1). Included are a range extension, two occurrences new to San Francisco Bay, one occurrence new to the Pacific coast, and description of an atypical color pattern.

Biological samples were taken periodically in South San Francisco Bay over a period of 2½ years (February 1972 to October 1974). Collection was by means of an 18 foot (5.4m) otter trawl sampling at a depth of 3 - 5 m from the R/V *Inland Seas* (operated by the education program of the Marine Ecological Institute, Redwood City).

Hand collected samples were also taken off the boat floats at marinas within the Port of Redwood City, Redwood City, California (Spring through Autumn 1974). Opisthobranchs were collected at Pete's Harbor at the foot of Whipple Avenue and at the Port of Redwood City, end of Harbor Boulevard.

DISTRIBUTION AND OCCURRENCE

SACOGLOSSA

1. *Elysia hedgpethi* Marcus, 1961

April, July, August 1972

west of Redwood Creek, otter trawl, silty clay bottom;

north of Dumbarton Bridge, otter trawl, silty clay bottom;

September 1974

Port of Redwood City, intertidal, silty clay and rip-rap;

NUDIBRANCHIA

Doridacea

2. *Diaulula sandiegensis* (Cooper, 1862)

April 1972

southwest of Bay Farm Island, otter trawl, bottom silty clay with shell material;

3. *Rostanga pulchra* MacFarland, 1905

April 1972

southwest of Bay Farm Island, otter trawl, bottom silty clay with shell material;

Aeolidacea

4. *Eubranchus misakiensis* Baba, 1960

March 1974

Redwood Creek, otter trawl, silty clay bottom;

October 1974

Port of Redwood City, off boat floats;

5. *Hermisenda crassicornis* (Eschscholtz, 1831)

February - August 1972 - 1974

throughout South San Francisco Bay, otter trawl, silty clay bottom;

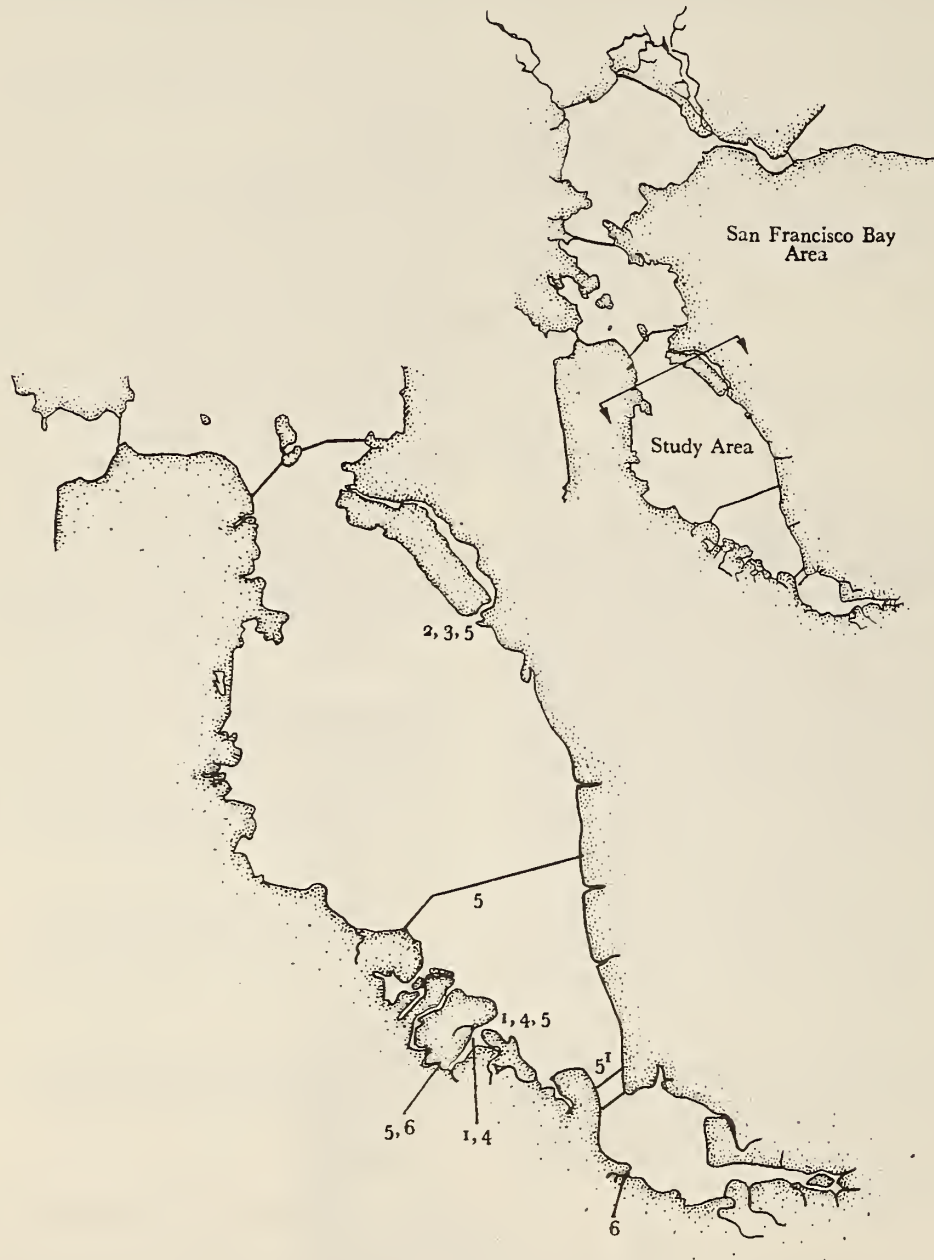


Figure 1

Map of South San Francisco Bay showing distribution of species

- | | |
|---------------------------------|-----------------------------------|
| 1. <i>Elysia hedgpethi</i> | 4. <i>Eubranchus misakiensis</i> |
| 2. <i>Diaulula sandiegensis</i> | 5. <i>Hermisenda crassicornis</i> |
| 3. <i>Rostanga pulchra</i> | 6. <i>Trinchesia</i> sp. |

October 1974

Pete's Harbor, off boat floats;

6. *Trinchesia* sp.

September - October 1974

Pete's Harbor, off boat floats;

September 1972

Palo Alto Yacht Club, off boat floats.

The only report of *Elysia hedgpethi* within San Francisco Bay was made by GODDARD (1973). Goddard collected 30 specimens from the Richardson Bay mudflat during the summer of 1972. On several occasions *Elysia* was encountered in trawl samples taken in the South Bay (see Figure 1). Trawls were at a depth of about 3 m. The *Elysia* were always in association with the algal species of *Bryopsis*, *Ulva* or *Gigartina*. Four specimens were collected on September 19, 1974 along the riprap shoreline of the industrial wharf at the Port of Redwood City. All specimens were in association with *Ulva* sp., and were collected at the minus 30 cm tide level. Fresh spiral egg masses were found near each specimen. This report accounts for the first occurrence of this species in the South Bay.

Diaulula sandiegensis was represented by a single specimen only. This specimen was trawled up offshore of Bay Farm Island. HOLLEMAN (1972) reported it from this same locality. Its occurrence in the North Bay was reported by GODDARD (1973).

To the authors' knowledge, *Rostanga pulchra* has never before been reported from within San Francisco Bay. On April 26, 1972, 2 specimens of *R. pulchra* were collected by trawl just southwest of Bay Farm Island. Regrettably, no additional observations or ecological comments can be added for this species at this time.

BEHRENS (1971b) first reported the occurrence of *Eubranhus misakiensis* in the eastern Pacific. That report, constituting a disjunct range extension from Japan, established the presence of this species at the San Francisco Municipal Marina. As noted in the original report, *E. misakiensis* from the boat floats occurred in association with campanularid hydroids. Egg masses were found on the hydroids.

Of particular interest is the atypical color pattern shown by the *Hermisenda crassicornis* collected in this area. Although BÜRGIN (1964) describes color variation in this species, none of the more than 50 specimens collected during this study exactly fits any of the previous descriptions.

In summarizing the color pattern of this highly variable species, BÜRGIN says, "The body pattern consists of blue lines running along the middle of the body and tail, forming two rhomboid patterns, one behind the rhinophores, a second outlining the pericardium. White or bluish lines also run along the sides of the body between the groups of cerata. They all converge on the tail. Within the first, and sometimes within the second of the rhomboid patterns, and on the side of the head there are very conspicuous orange markings."

In the animals we have collected the longitudinal lines on the body are always white, never blue.

Indeed, this lack of blue coloration is what called our attention to the apparent color difference.

The white lines along the cephalic tentacles and foot corners are as described by BÜRGIN (1964). However, just anterior to the rhinophores, where these lines normally converge and continue down the dorso-medial surface to the tail, the pattern deviates from the description. In the South Bay specimens the white lines become broken and irregular just before convergence dorso-medially. Posteriorly they form a single broken line which disappears in the region of the pericardium. Further posteriorly on the dorsal surface, particularly between the ceratal groups, is an assemblage of random white specks. The white stripe reforms in normal fashion once again at the last ceratal group, and continues as such to the tip of the tail (Figure 2). No rhomboid patterns typical of *Hermisenda* were observed. The only orange coloration on the body was restricted to the head region.

The cerata differed in color pattern from BÜRGIN'S (1964) description only slightly, the most obvious difference being the lack of yellow, orange or blue exterior patches or bands. The cerata were seen to be transparent to yellowish-orange in ground color. They were tipped with the typical white or very light yellow cone. Below the cone the coloration deviated from the described color variations. Pigmentation in this region of the cerata consisted of white speckles and blotches arranged in a vertical line. The color and shape of the digestive diverticula extending up through the cerata conform with BÜRGIN'S description.

Other than the described deviations in color pattern, the specimens were in full agreement with previous descriptions. A radular analysis was conducted to eliminate any questions of misidentification. The results of this analysis confirmed the identification as *Hermisenda*, and most probably *H. crassicornis*.

During September and October, 1974, a nudibranch referable to *Trinchesia* was found living in the South Bay.

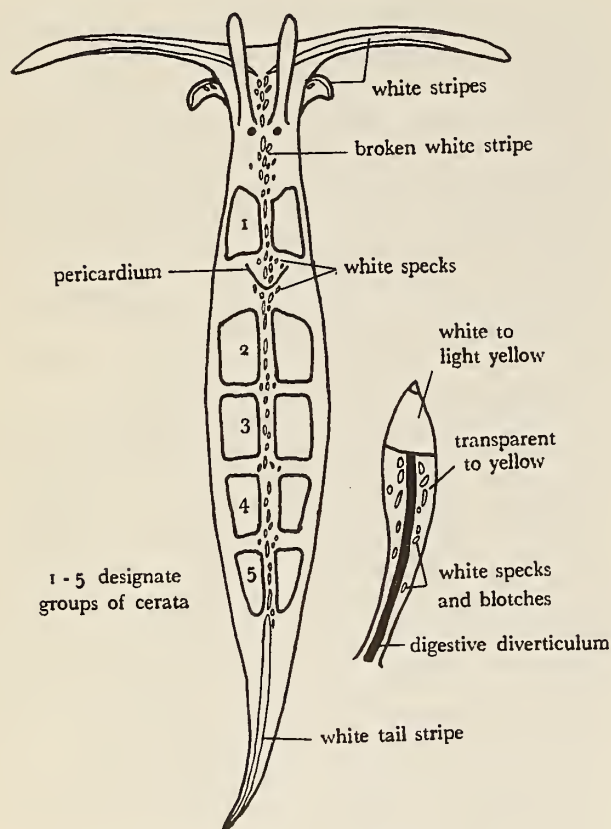


Figure 2

Drawing of *Hermisenda crassicornis*

left - body showing atypical white striping
right - cerata showing color pattern

Although this species does not appear to be one of the local coastal resident forms, we have not ascertained whether it is a foreign introduction or an undescribed species. Some 105 specimens were either collected or observed with egg masses on dense growths of the naked hydroid, *Tubularia crocea* (Agassiz, 1862) growing on the

boat floats and boat bottoms at Pete's Harbor, Port of Redwood City, Redwood City, California. The specimens measured from 2 to 28mm in length and displayed a wide variation in ceratal color (from yellow to reddish-brown). Egg masses were numerous.

Gary McDonald of the Moss Landing Marine Laboratories (personal communication 27 November 1974) informed us that a similar eolid nudibranch was collected from the Palo Alto Yacht Club docks on 20 September 1972, by Mr. Mark Silberstein. On that occasion, 7 specimens measuring from 5 to 10mm in length were collected. All were found on the introduced anemone *Haliplanelia luciae* (Verrill, 1898).

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